

**DUF<sub>6</sub>**

Depleted Uranium  
Hexafluoride  
Conversion Project

**DUF6-UDS-PLN-056**

**REVISION 0**

**APRIL 2008**

# **MAINTENANCE IMPLEMENTATION PLAN**

**Uranium Disposition Services, LLC**  
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## Depleted Uranium Hexafluoride Conversion Project

### Maintenance Implementation Plan, Rev. 0

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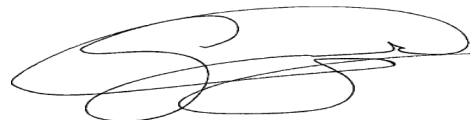
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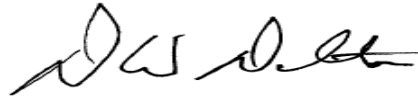
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**DUF6 CONVERSION PROJECT  
MAINTENANCE IMPLEMENTATION PLAN**

**Revision Summary**

|   |  |                         |
|---|--|-------------------------|
| <b><u>TITLE:</u></b><br><i>MAINTENANCE IMPLEMENTATION PLAN</i>  | <b><u>DOCUMENT NO:</u></b><br>DUF6-UDS-PLN-056 | <b><u>REV:</u></b><br>0 |
| <b>REVISION DESCRIPTION</b> <ul style="list-style-type: none"><li>• Revision A for DOE review.</li><li>• Revision B for updating of referenced procedure names and titles that changed due to implementation of a new document numbering system.</li><li>• Revision 0, Initial Issuance</li></ul> |  |                         |

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## LIST OF ACRONYMS

|                  |   |
|------------------|---|
| ALARA            | as low as is reasonably achievable                |
| CRD              | contractor requirements document                  |
| DOE              | Department of Energy                              |
| DSA              | documented safety analysis                        |
| DUF <sub>6</sub> | depleted uranium hexafluoride                     |
| ES&H             | environmental safety and health                   |
| FIMS             | Facility Information Management System (database) |
| ISMS             | integrated safety management system               |
| M&TE             | measuring and test equipment                      |
| MEL              | master equipment list                             |
| MIP              | maintenance implementation plan                   |
| MPS              | Maintenance and Production System (database)      |
| PPE              | personal protective equipment                     |
| QA               | quality assurance                                 |
| SSC              | structure, system, or component                   |
| TSR              | technical safety requirement                      |
| UDS              | Uranium Disposition Services, LLC                 |





## 1. INTRODUCTION

The Department of Energy (DOE) awarded contract DE-AC05-02OR22717 to Uranium Disposition Services, LLC (UDS) on August 29, 2002, to construct and operate two conversion facilities that will convert depleted uranium hexafluoride (DUF<sub>6</sub>) to uranium oxide for reuse or disposal. The contract requires that UDS comply with the provisions of DOE Order 433.1A, *Maintenance For Nuclear Facilities*. This plan describes how UDS will meet the management program provisions of this order.

## 2. FORMAT OF THIS DOCUMENT

This maintenance implementation plan (MIP) is formatted to show the relationship between MIP sections and the contractor requirements document (CRD) of DOE O 433.1 (hereafter referred to as the Order). Attachment 1 of this plan, *DOE Order 433.1A Contractor Requirements Document Crosswalk*, shows the relationship between Order requirements and UDS implementing procedures.

## 3. GRADED APPROACH

A graded approach based on risk to workers, the public, and the environment is used to apply resources to maintenance activities at UDS conversion facilities. Through the use of a graded approach, objectives of the Order are met; the health and safety of personnel and the public are ensured; the environment is protected; and the mission of the UDS project is sustained through good stewardship of assets.

The risk to safety, health, and environmental protection is significant but not the sole consideration in application of the graded approach. Focus on mission critical activities and facility life cycles also influence the allocation of resources. The degree of risk and the nature of mission activities (or complexities) relate directly to allocation of resources, priority of performing maintenance, concentration on depth and range of procedures, training, and qualification of personnel, procurement of materials, quality assurance, reporting, and documentation. *Graded Approach*, UDS-QAP-004, provides detailed information on the application of the graded approach at UDS.

## 4. GENERAL REQUIREMENTS

### 4.1 APPLICABILITY

The requirements of the Order apply to nuclear facilities and their applicable safety class, safety significant, and defense in depth structures, systems, and components (SSCs) managed and operated by UDS at its respective host sites. Additionally, other non-safety equipment items might be included in the program. These other items, though not specifically referred to in facility authorization basis documents or

documented safety analyses (DSAs), are maintained to the standards necessary to preserve infrastructure assets as required by DOE O 430, *Lifecycle Facility Operations*.

The complete and approved lists of configuration items—including safety significant, defense-in-depth, and other vital safety systems—are maintained in configuration-controlled documentation. *Configuration Management Plan*, DUF6-UDS-PLN-023, describes the methods by which UDS maintains the configuration of safety SSCs.

This plan applies to maintenance activities when systems or components are transitioned from Construction to Operations.

## **4.2 REQUIREMENTS—DOE O 433.1A, ATTACHMENT 1, CONTRACTOR REQUIREMENTS DOCUMENT**

### **4.2.1 CRD 1.0—Contractors must develop and submit for DOE approval maintenance implementation plans that clearly define the following:**

#### **4.2.1.1 1.a.—Master equipment list (MEL) of SSCs included in the program [all safety SSCs that are (1) identified in the nuclear facility safety basis, (2) critical to mission objectives or facility operations, or (3) desirable for inclusion in the maintenance program for other reasons].**

The complete and approved lists of configuration items (including safety-significant, defense-in-depth, and other vital safety systems) are maintained by UDS in controlled documents. Configuration control of safety SSCs is ensured through implementation of *Configuration Management Plan*, DUF6-UDS-PLN-023, and *Control of Work*, UDS-U-GFP-0108. The configuration management plan governs the MEL through *Identification and Control of Configured Items*, UDS-EDI-002. The MEL is maintained on a component-per-system basis and selected information resides within the maintenance and production system (MPS) database, wherein the facility manager identifies the systems or components considered necessary for safe operation of the facility. UDS does not operate any safety class SSCs.

Personnel performing maintenance have access to, and are able to rely on, the facility MEL and the expertise of the facility manager, system engineer, or safety analysis engineers to identify safety SSCs.

#### **4.2.1.2 1.b.—Periodic inspection of SSCs and equipment to determine whether degradation or technical obsolescence threatens performance or safety.**

*Assessing System Status and Performance*, UDS-U-PEP-1003, addresses the requirement for system engineers to monitor performance, inspect systems periodically, and assist Operations and Maintenance personnel in assessing aging equipment. An in-service inspection control program is implemented in the conversion facility through the application of UDS-U-PEP-1003, which also addresses the periodic inspection requirements noted above.

**4.2.1.3 1.c.—Management systems that control maintenance of defined SSCs (work control, post-maintenance testing, material procurement and handling, and control and calibration of test equipment).**

*Control of Work*, UDS-U-GFP-0108, addresses requirements for approving and performing work within UDS facilities.

Any modification of safety SSCs requires the use of *Configuration Management Plan*, DUF6-UDS-PLN-023.

Post-maintenance testing is conducted in accordance with *Post-Maintenance Testing*, UDS-U-PEP-1004.

Processes for inspecting and testing items, services, and processes against established criteria to determine acceptability are provided in *Project Quality Assurance Plan (PQAP)*, DUF6-UDS-PLN-003; *Material Control*, UDS-U-MNT-0004; and *Commercial Grade Items Dedication*, UDS-U-QAP-0026.

*Control of Measuring and Test Equipment*, UDS-U-MNT-0603, addresses the control and calibration of instrumentation and test equipment.

**4.2.1.4 1.d.—Assignment of roles and responsibilities.**

The assignment of key roles and responsibilities is addressed in *Conduct of Operations Manual*, UDS-U-CON-0001. Internal maintenance procedures provide specific guidance for personnel assigned responsibilities for maintenance. Specific assignments are given to staff via *Control of Work*, UDS-U-GFP-0108. *Training and Qualification*, UDS-U-TRN-0001, describes the means by which UDS conducts training for all activities, including maintenance-related work.

**4.2.1.5 1.e.—Interfaces between maintenance and other organizations (e.g., Operations, Engineering, and Training).**

UDS procedures, plans, and organizational charts show the relationship between Operations, Maintenance, Environmental Safety, and Health (ES&H), Quality Assurance (QA), Training, and other functional areas. *Conversion Facilities Operations and Maintenance Plan*, DUF6-UDS-PLN-014, ensures that assignments are carried out in accordance with management requirements.

**4.2.1.6 1.f.—The integration of the maintenance management program with:**

**4.2.1.6.1 (1)—The Integrated Safety Management System (ISMS) established by DOE P 450.4 and 48 CFR 970.5204-2**

ISMS is integrated with the maintenance management program through *Control of Work*, UDS-U-GFP-0108, and *Hazard Assessment*, UDS-U-SHP-0211, within which procedure steps relate directly to ISMS elements: Identify the scope of work, analyze hazards and define work controls, execute work, and provide feedback and lessons

learned. Maintenance activities are governed by *Integrated Safety Management Systems – Operations*, DUF6-UDS-PLN-040.

#### **4.2.1.6.2 (2)—*Real property asset management programs under DOE O 430.1A***

*Life Cycle Asset Management* has been replaced by DOE O 430.1B, *Real Property Asset Management*, issued by DOE on September 24, 2003. UDS is implementing the applicable portions of this order via *Asset Management Plan*, DUF6-UDS-PLN-030, which has been approved—along with its implementing procedures—by the DOE-assigned property administrator.

#### **4.2.1.6.3 (3)—*Required nuclear safety basis established under 10 CFR Part 830, Sub. B***

*Paducah Conversion Facility Documented Safety Analysis*, DUF6-UDS-C-G-DSA-001, and *Portsmouth Conversion Facility Documented Safety Analysis*, DUF6-UDS-X-G-DSA-001, describe the safety basis and hazards analyses for their respective conversion facilities. The procedures listed in the DSA flow-down matrices help ensure that the safety basis is maintained.

*Technical Safety Requirements for the DUF<sub>6</sub> Conversion Facility, Paducah Kentucky* UDS-C-TSR-002, and *Technical Safety Requirements for the DUF<sub>6</sub> Conversion Facility, Portsmouth Ohio* UDS-X-TSR-002, describe the requirements necessary to operate the conversion facilities within the safety envelope described in the DSAs.

*Safety Management Program Descriptions for the Uranium Disposition Services, LLC, DUF<sub>6</sub> Conversion Project*, DUF6-UDS-PLN-037, describes the safety management programs used to maintain the safety envelope.

The above aspects for UDS operated cylinder storage yards are described in the following documents:

- DUF6-X-G-DSA-002, *Documented Safety Analysis for the Department of Energy X-745C, X-745E and X-745G-1 UF<sub>6</sub> Cylinder Storage Yards, Piketon, Ohio*
- UDS-X-TSR-001, *Technical Safety Requirements for the Department of Energy X-745C, X-745E, and X-745G-1 UF<sub>6</sub> Cylinder Storage Yards, Piketon*
- DUF6-C-G-DSA-002, *Documented Safety Analysis for the Department of Energy C-745 UF<sub>6</sub> Cylinder Storage Yards, Paducah, Kentucky*
- UDS-C-TSR-001, *Technical Safety Requirements for the Department of Energy C-745 UF<sub>6</sub> Cylinder Storage Yards, Paducah, Kentucky*
- DUF6-UDS-PLN-037, *Safety Management Program Descriptions for the Uranium Disposition Services, LLC DUF<sub>6</sub> Conversion Project*

**4.2.1.6.4 (4)—Quality assurance program established under 10 CFR Part 830, Sub. A**

Maintenance programs are implemented in accordance with 10 CFR 830 subpart A, *Quality Assurance Program*, as described in *Project Quality Assurance Plan*, DUF6-UDS-PLN-003, and the following procedures:

- UDS-U-GFP-0108, *Control of Work*
- UDS-U-MNT-0603, *Control of Measuring and Test Equipment*
- UDS-QAP-004, *Graded Approach*
- UDS-U-QAP-0005, *Condition Reporting*
- UDS-U-MNT-0601, *Measurement and Calibration Program*

**4.2.1.7 1.g.—A configuration management process to ensure the integrity of the identified nuclear facility safety SSCs using a graded approach.**

To ensure the integrity of the identified nuclear facility safety SSC using a graded approach, configuration management processes are implemented in accordance with *Configuration Management Plan*, DUF6-UDS-PLN-023. *Graded Approach*, UDS-QAP-004, describes the process for applying the graded approach concept to conversion operations. Through *Engineering Review and Approval of Design Documents*, UDS-EDP-001, actions have been completed to develop a baseline set of system schematic drawings for each safety SSC, to serve as the field-verified drawings for the operation of these systems.

**4.2.1.8 1.h.—A prioritization process that places proper emphasis on safety requirements, maintenance backlog, system availability, and requirements for infrastructure elements identified as part of the nuclear facility safety bases.**

*Control of Work*, UDS-U-GFP-0108, includes methods for prioritizing work based on (1) whether SSCs are affected and (2) the nature of work to be performed on an SSC. The work control process provides the means to ensure that conversion facilities are maintained in a manner that protects the health and safety of employees, users, visitors, guests, the public, and the environment. System availability and status are assessed using *Assessing System Status and Performance*, UDS-U-PEP-1003.

**4.2.1.9 1.i.—Process for feedback and improvement based on relevant information from the results of operations, maintenance, and assessment efforts.**

*Control of Work*, UDS-U-GFP-0108, requires a post-job debriefing to provide feedback and improvement based on lessons learned from the maintenance activity.

*Management Assessments*, UDS-U-QAP-0013, describes the assessment process used in the conversion facilities.

*Lessons Learned*, UDS-U-QAP-0017, provides a process for feedback and improvement based on prior lessons learned.

*Systems Engineering*, UDS-U-PEP-1009, provides for the periodic and systematic analysis of the effectiveness of the maintenance program.

**4.2.1.10 1.j.—*Descriptions of how system engineers assigned to safety systems are involved in the planning and execution of maintenance activities affecting their assigned systems with (1) the requisite knowledge of the system safety design basis and operating limits from the safety analysis and (2) the lead responsibility for the configuration management of the design.***

*Systems Engineering*, UDS-U-PEP-1009, provides the requirements for assigning system engineers who possess sufficient knowledge of their systems and their associated design bases and operating limits. *Configuration Management Plan*, DUF6-UDS-PLN-023, ensures that all work on configured items is reviewed and approved by appropriate systems engineering personnel.

**4.2.1.11 1.k.—*Accurate maintenance histories that compile data on retrievable structures, systems, and components as well as maintenance resources and costs, in a form that facilitates entry [into the DOE Facility Information Management System (FIMS) database] of information about required maintenance costs, actual maintenance costs, and availability data and failure rates for mission-critical and safety SSCs.***

Maintenance histories that compile data on structures, systems, and components are maintained in the MPS database. *Systems Engineering*, UDS-U-PEP-1009, describes the types of maintenance-history data that must be collected and analyzed. Appropriate data are collected and reported to FIMS in accordance with *Asset Management Plan*, DUF6-UDS-PLN-030. The property management database addresses the handling of government real property relating to FIMS. *Conversion Facilities Operations and Maintenance Plan*, DUF6-UDS-PLN-014, directs that such data be collected. The MPS tracks maintenance costs associated with systems or components such as labor, parts consumption, etc.

**4.2.2 CRD 2.0—*The contractor maintenance management program should (1) establish metrics to measure performance and identify maintenance issues requiring corrective action and lessons learned, (2) incorporate voluntary consensus standards, and (3) address the following elements as appropriate.***

*Systems Engineering*, UDS-U-PEP-1009, provides direction for the collection of maintenance program metrics, by which management can assess the effectiveness of the program.

**4.2.3 CRD 3.0—The contractor maintenance management program should address the following elements, as appropriate.**

**4.2.3.1 3.a.—Maintenance Organization and Administration, which must ensure a high level of performance through effective implementation and control of activities.**

Adequate written policies and procedures are used to control maintenance activities to ensure safe operations. *Control of Work*, UDS-U-GFP-0108, provides detailed instructions for controlling maintenance activities and also provides for thorough reviews of maintenance activities by facility managers and other managers before work starts.

Functional managers are responsible for ensuring that assessments are conducted in their respective areas, to evaluate the effectiveness of programs in accordance with *Management Assessments*, UDS-U-QAP-0013.

**4.2.3.2 3.b.—Training and Qualification of Maintenance Personnel, which must be implemented to develop and maintain the knowledge and skills that personnel need to effectively perform maintenance activities.**

UDS personnel assigned to jobs or tasks in nuclear facilities are qualified in accordance with *Training and Qualification*, UDS-U-TRN-0001. UDS personnel assigned to jobs or tasks in nuclear facilities fulfill corporate quality and ES&H training qualifications identified by the operating organization as required for the work activities. Training requirements are listed in UDS training matrices.

*Training and Qualification*, UDS-U-TRN-0001, requires that personnel not trained to the level indicated may perform work on facility engineered safety features only under the direct oversight of qualified facility personnel (e.g., a qualified system engineer). Minimally, system training includes the following elements:

- Purpose of the system, as described in the associated system design description and facility design description
- General description of the system, including major components, relationships to other systems, and safety implications associated with working on the system
- Related industry and facility-specific experience

**4.2.3.3 3.c.—Maintenance Facilities, Equipment, and Tools that support nuclear facility maintenance and training efficiently.**

UDS has furnished adequate maintenance facilities, equipment, and tools to help ensure that maintenance activities can be accomplished effectively. When required, mock-ups, fixtures, and special tools are identified and made available. *Conversion Facilities Operations and Maintenance Plan*, DUF6-UDS-PLN-014, requires that adequate support facilities, equipment, and training be available at all times to support the maintenance function.

**4.2.3.4 3.d.—Types of Maintenance that balance corrective and preventive maintenance properly, to provide a high degree of confidence that (1) nuclear facility equipment degradation is identified and corrected, (2) equipment life is optimized, and (3) the maintenance program is cost effective.**

*Systems Engineering*, UDS-U-PEP-1009, describes the goals and objectives of the preventative and corrective maintenance programs. *Systems Engineering* also describes the metrics by which the program's efficiency and effectiveness are tracked and analyzed. The maintenance program is implemented primarily through the MPS database.

**4.2.3.5 3.e.—Maintenance Procedures and other work-related documents (e.g., drawings and instructions) prepared and used to provide appropriate work direction and to ensure that maintenance is performed safely and efficiently.**

Key management systems, activities, processes, and procedures provide requirements and guidance for the development, review, approval, control, and maintenance of documents and records. *Procedure System*, UDS-U-QAP-0003, governs the generation of approved work procedures.

*Control of Work*, UDS-U-GFP-0108, provides the processes for planning and controlling work and identifying associated risks and hazards, including guidance pertinent to the use or development of instructions, procedures, and other work-specific documentation.

*Document Control*, UDS-U-DMP-0001, provides direction for managing drawings, work instructions, procedures, or other controlled documents. *Records Management*, UDS-U-DMP-0002, addresses the retention and disposition of records.

**4.2.3.6 3.f —Planning, Scheduling, and Coordinating Maintenance, to:**

- (1) Ensure that maintenance and surveillances associated with technical safety requirements (TSRs) are accomplished in a timely manner**
- (2) Improve efficiency**
- (3) Reduce chemical and physical hazards and radiation exposures to as-low-as-reasonably-achievable (ALARA) levels**
- (4) Increase equipment availability**
- (5) Ensure worker safety through training and proper use of personnel protective equipment (PPE)**
- (6) Ensure hazardous waste is properly segregated, treated, or disposed of**
- (7) Ensure hazards are properly identified, assessed, and controlled before maintenance work commences**



The MPS database tracks, schedules, and monitors the completion of all maintenance activities, including surveillances associated with TSRs.

*Systems Engineering*, UDS-U-PEP-1009, provides the means by which the maintenance program is evaluated for effectiveness and efficiency. *Systems Engineering* also requires that Engineering track equipment or system availability.

*Assessing System Status and Performance*, UDS-U-PEP-1003, provides for periodic review of system performance against design goals or standards.

*Control of Work*, UDS-U-GFP-0108, governs work planning and conduct. *Control of Work* also addresses the identification and control of associated hazards and risks (including chemical, radiological, and physical). Work instructions also provide for the proper segregation and initial packaging of waste resulting from the maintenance or work activity.

*Waste Management Plan*, DUF6-UDS-PLN-005, and its implementing procedures address the treatment, handling, storage, and disposal of wastes.

*Radiation Protection Plan*, DUF6-UDS-PLN-007, and its implementing procedures (such as *ALARA/Design and Control*, UDS-RPP-017) provide direction for protecting personnel from radiological hazards.

UDS identifies hazards using *Hazard Assessment*, UDS-U-SHP-0211, and develops protective measures (some of which include the use of PPE). *Personal Protective Equipment*, UDS-U-SHP-0210, provides general guidance on the use of PPE; ES&H then develops training materials that provide details regarding proper use of PPE. The training group administers PPE-related training in accordance with *Training and Qualification*, UDS-U-TRN-0001.

**4.2.3.7 3.g.—Control of Maintenance Activities, to include management involvement to ensure that safe, reliable nuclear facility operations are integrated with work-authorization and -control requirements for conduct of operations.**

Effective programs are in place to provide oversight and direct supervision of personnel performing maintenance activities on safety SSCs, via *Control of Work*, UDS-U-GFP-0108, and *Configuration Management Plan*, DUF6-UDS-PLN-023.

*Control of Work*, UDS-U-GFP-0108, requires management review and approval of work packages prior to start of work.

The effectiveness of maintenance practices is monitored through the use of *Systems Engineering*, UDS-U-PEP-1009.

**4.2.3.8 3.h.—Post-Maintenance Testing performed to verify that components fulfill their design functions when returned to service after maintenance.**

Post-maintenance testing is conducted in accordance with *Post-Maintenance Testing*, UDS-U-PEP-1004.

**4.2.3.9 3.i.—Procurement of Parts, Materials, and Services required for maintenance activities available when needed.**

The MPS database contains a material requirements planning module that is used to manage the inventory of parts and materials, through inventory control such as the setting of minimum/maximum stock points and automatic stock reorder points, inventory notification flags, etc. For services, the approved vendor list specifies vendors who meet criteria established for their respective services. Procurements are made in accordance with *Purchase Requisition*, UDS-U-PRP-0002.

**4.2.3.10 3.j.—Receipt, Inspection, Handling, Storage, Retrieval, Issuance, and Return (for Disposal) of Personal Property for maintenance covered by effective implementation of policies and procedures; suspect and counterfeit item control requirements; and high-risk personal property management and control requirements (from the time an item is received for installation in, or maintenance of, the nuclear facility until it is turned in for disposal).**

*Project Quality Assurance Plan (PQAP)*, DUF6-UDS-PLN-003, provides processes for the inspection and acceptance testing of an item, service, or process against established criteria to determine acceptability. *Material Control*, UDS-U-MNT-0004, and *Commercial Grade Items Procurement*, UDS-U-QAP-0026, set forth requirements for the acceptance of procured items. *Material Control*, UDS-U-MNT-0004, provides guidance on the handling, storage, retrieval, and issuance of stored items. *High Risk Property*, UDS-U-PRP-0027, governs the handling of high-risk property items from procurement to the excess property process.

The need for inspection and acceptance testing is determined during project or activity planning, based on *Graded Approach*, UDS-QAP-004. When required, acceptance and performance criteria are developed and documented for key, complex, or critical inspection/test activities. Nonconforming items are identified to avoid inadvertent use, per *Project Quality Assurance Plan (PQAP)*, DUF6-UDS-PLN-003. *Material Receipt Control*, UDS-PRP-022, addresses the proper receipt of materials. These processes also specify how inspection and test status (i.e., accept, reject) will be indicated—either on the item itself, or on documentation traceable to the item. Property is disposed of in accordance with *Asset Management Plan*, DUF6-UDS-PLN-030. *Suspect/Counterfeit Items*, UDS-U-QAP-0028, addresses the handling of suspect or counterfeit items.

**4.2.3.11 3.k.—Control and Calibration of Measuring and Test Equipment (M&TE) consistent with quality assurance requirements, to ensure acceptable accuracy and precision of nuclear instrumentation and equipment.**

Designated inspections and tests are performed using calibrated and maintained equipment. UDS identifies equipment requiring calibration; the calibration status is readily discernible, and associated calibration procedures, documentation, and records are prepared and maintained. Calibrated equipment is properly protected, handled, and maintained to preclude damage that could invalidate its accuracy. M&TE found out of calibration is identified, and its impact on plant equipment is evaluated.

M&TE will be calibrated in accordance with *Control of Measuring and Test Equipment*, UDS-U-MNT-0603. *Measurement and Calibration Program*, UDS-U-MNT-0601, provides guidance for the application of the calibration program. In cases where UDS subcontracts M&TE calibrations, approved vendors will be used, and contracts or work authorizations will provide written commitments of how equipment is to be supported by the vendor organization.

**4.2.3.12 3.l.—Maintenance Tools and Equipment Control methods established to provide for (1) storage, issuance, and maintenance of an adequate and readily available supply of tools and equipment and (2) the development of special tools and equipment as needed.**

*Systems Engineering*, UDS-U-PEP-1009, requires that system engineers review systems and components to ensure that an adequate number of spare parts and special tools are available.

**4.2.3.13 3.m.—Facility Condition Inspections conducted by management periodically (independent assessments of equipment and facilities) to ensure safe nuclear facility condition and housekeeping and to meet the fire-protection and natural-hazard phenomena-mitigation requirements of DOE O 420.1A, Facility Safety.**

*Assessing System Status and Performance*, UDS-U-PEP-1003, provides guidance on performing periodic inspections of structures and equipment.

Management and independent assessments are completed in accordance with *Independent Assessments*, UDS-U-QAP-0012, and *Management Assessments*, UDS-U-QAP-0013.

*Asset Management Plan*, DUF6-UDS-PLN-030, requires periodic walk-throughs of facility spaces (and equipment therein) to evaluate conditions. *Fire Evacuation Alarms and Good Housekeeping Practices*, UDS-SHP-803, provides specific guidance on housekeeping practices, and *Program for Controlling Combustion and Ignition Sources*, UDS-SHP-810, addresses part of the fire protection program.

*Systems Engineering*, UDS-U-PEP-1009, requires the system engineer to assist facility management in performing and documenting the equipment-aging and component-assessment process (on a graded approach commensurate with the system's importance and reliability). This process may include activities such as the following, as appropriate:

- Component screening to identify life-limiting components
- Aging and degradation evaluation of identified components
- Identification of material condition measurements
- Determination of facility remaining lifetime
- Identification of component life extension techniques
- Feasibility status of continued and extended system operation

**4.2.3.14 3.n.—Management Involvement from corporate and nuclear facility officials (sufficient for them to be technically informed and personally familiar with facility status and conditions).**

Managers and supervisors are kept informed of facility conditions in accordance with the requirements of *Conduct of Operations Manual*, UDS-U-CON-0001.

UDS functional managers are responsible for planning and performing performance assessments to evaluate how effectively their organizations achieve performance objectives, in accordance with *Management Assessments*, UDS-U-QAP-0013.

Functional managers are accountable for approving work conducted in their facilities. Functional manager reviews and approvals are documented on work package documents, in accordance with *Control of Work*, UDS-U-GFP-0108.

**4.2.3.15 3.o.—Maintenance History and trending program, to (1) document historical information for maintenance planning and (2) support maintenance and performance trending of nuclear facility systems and components (with all records and documentation maintained according to an approved site-specific records retention and disposition schedule).**

Maintenance history files (which compile data about structures, systems, and components) are managed in the MPS database. This database also includes instrument or component calibration and testing histories. The maintenance history for components or systems can be manipulated to (1) provide trend analyses for use by engineering or maintenance personnel or (2) show item performance in terms of replacement history, failure modes, repair costs, or other parameters as needed to diagnose and improve equipment or system performance. *Systems Engineering*, UDS-U-PEP-1009, requires the system engineer to effectively use MPS database information

to evaluate component maintenance history and to trend equipment performance and failure rates.

**4.2.3.16 3.p.—Analysis of Maintenance Problems to determine and correct root causes of unplanned occurrences related to maintenance.**

*Condition Reporting*, UDS-U-QAP-0005, defines the processes used to systematically analyze unplanned occurrences related to maintenance and to determine whether a root cause analysis is required. If required, such analyses are performed in accordance with *Root Cause Analysis*, UDS-U-QAP-0018. Maintenance activities are tracked and trended in accordance with *Trending*, UDS-U-QAP-0019.

**4.2.3.17 3.q.—Modification Work at nuclear facilities accomplished under the same basic administrative controls as those applied to nuclear facility maintenance (so that risks to the facility, equipment, environment, or personnel do not increase because of modifications). Controls should be integrated with:**

- (1) **Safety basis, nuclear safety, fire protection, and mitigation of natural-hazard phenomena [see DOE O 420.1A]**
- (2) **Pressure safety and suspect and counterfeit item control [see DOE O 440.1A]**
- (3) **Control of equipment and system status [see DOE 5480.19]**

All work, including modification work, is controlled using *Control of Work*, UDS-U-GFP-0108; *Configuration Management Plan*, DUF6-UDS-PLN-023; *Design Change Control*, UDS-EDP-012; and other internal operating procedures.

*Project Quality Assurance Plan (PQAP)*, DUF6-UDS-PLN-003, establishes the requirements that items used at UDS will be (1) purchased from suppliers whose QA programs have been evaluated (and found to be acceptable) or purchased as commercial-grade items and (2) dedicated to safety level service. DUF6-UDS-PLN-003 also includes provisions for suspect and counterfeit item control requirements, in accordance with *Suspect/Counterfeit Items*, UDS-U-QAP-0028.

UDS operates unfired pressure vessels in compliance with applicable state regulations.

*Unreviewed Safety Questions*, UDS-U-NSP-0002, provides requirements for safety-basis reviews.

*Suspect Counterfeit Item Control*, UDS-U-QAP-0028 applies to parts or components used in maintenance or modification activities. *Supplier Quality Program Evaluation*, UDS-U-QAP-0014, requires the use of approved suppliers for safety significant items and services.

*Assessing System Status and Performance*, UDS-U-PEP-1003, provides the means for determining the status of systems and components.

**4.2.3.18 3.r.—Seasonal Facility Preservation, to prevent equipment and building damage resulting from weather conditions.**

Seasonal facility preservation is achieved via the preventive maintenance program, which provides for freeze protection in facilities that may be at risk. Planning for severe conditions is conducted in accordance with *Facility Protection for Severe Conditions*, UDS-U-PEP-2002.

## **5. REFERENCES**

### **5.1 REQUIREMENTS REFERENCES**

10 CFR 830, *Nuclear safety management*

48 CFR 45, *Government property*

48 CFR 970, *DOE management and operating contracts*

DOE 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Facilities*

DOE G 433.1-1, *Nuclear Facility Maintenance Management Program Guide for Use with DOE O 433.1*

DOE G 440.1-6

DOE G 450.4-1B, *Integrated Safety Management System Guide (Volume 1) for use with Safety Management System Policies (DOE P 450.4, DOE P 450.5, and DOE P 450.6); The Functions, Responsibilities, and Authorities Manual; and the DOE Acquisition Regulation*

DOE O 200.1, *Information Management Program*

DOE O 414.1C, *Quality Assurance*

DOE O 420.1B, *Facility Safety*

DOE O 430.1B, *Real Property Asset Management*

DOE O 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*

DOE O 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*

DOE O 5480.19, *Conduct of Operations Requirements for DOE Facilities*

DOE P 450.4, *Safety Management System Policy*

DOE Personal Property Letter 970-3

DOE-HDBK-1003-96, *Guide to Good Practices for Training and Qualification of Maintenance Personnel*

DOE-HDBK-1206-98, *Guide to Good Practices for On-the-Job Training*

DOE-NE-STD-1004-92

DOE-STD-1029-92, *Writer's Guide for Technical Procedures*

DOE-STD-1039-93, *Guide to Good Practices for Operations Turnover*

DOE-STD-1073-2003, *Configuration Management Program*

## **5.2 CONTENT REFERENCES**

DUF6-C-G-DSA-002, *Documented Safety Analysis for the Department of Energy C-745 UF<sub>6</sub> Cylinder Storage Yards, Paducah, Kentucky; Revision 1, August 2006*

DUF6-UDS-C-G-DSA-001, *Paducah Conversion Facility Documented Safety Analysis*

DUF6-UDS-PLN-003, *Project Quality Assurance Plan (PQAP)*

DUF6-UDS-PLN-005, *Waste Management Plan*

DUF6-UDS-PLN-007, *Radiation Protection Plan*

DUF6-UDS-PLN-014, *Conversion Facilities Operations and Maintenance Plan*

DUF6-UDS-PLN-023, *Configuration Management Plan*

DUF6-UDS-PLN-030, *Asset Management Plan*

DUF6-UDS-PLN-037, *Safety Management Program Descriptions for the UDS, LLC DUF<sub>6</sub> Conversion Project*

DUF6-UDS-PLN-040, *Integrated Safety Management Plan - Operations*

DUF6-UDS-PLN-056, *Maintenance Implementation Plan*

DUF6-UDS-X-G-DSA-001, *Portsmouth Conversion Facility Documented Safety Analysis*

DUF6-X-G-DSA-002, *Documented Safety Analysis for the Department of Energy X-745C, X-745E and X-745G-1 UF<sub>6</sub> Cylinder Storage Yards, Piketon, Ohio; Revision 0, February 2006*

UDS-C-TSR-001, *Technical Safety Requirements for the Department of Energy C-745 UF<sub>6</sub> Cylinder Storage Yards, Paducah, Kentucky; Revision 1, February 2006*

UDS-C-TSR-002, Technical Safety Requirements for the DUF6 Conversion Facility, Paducah, Kentucky

UDS-EDI-002, *Identification and Control of Configured Items*

UDS-EDP-001, *Engineering Review and Approval of Design Documents*

UDS-EDP-012, *Design Change Control*

UDS-PRP-022, *Material Receipt Control*

UDS-QAP-004, *Graded Approach*

UDS-RPP-017, *ALARA/Design and Control*

UDS-SHP-803, *Evacuation Alarms and Good Housekeeping Practices*

UDS-SHP-810, *Program for Controlling Combustion and Ignition Sources*

UDS-U-CON-0001, *Conduct of Operations Manual*

UDS-U-DMP-0001, *Document Control*

UDS-U-DMP-0002, *Records Management*

UDS-U-GFP-0108, *Control of Work*

UDS-U-MNT-0004, *Material Control*

UDS-U-MNT-0601, *Measurement and Calibration Program*

UDS-U-MNT-0603, *Control of Measuring and Test Equipment*

UDS-U-NSP-0002, *Unreviewed Safety Questions*

UDS-U-PEP-1003, *Assessing System Status and Performance*

UDS-U-PEP-1004, *Post-Maintenance Testing*

UDS-U-PEP-1009, *Systems Engineering*

UDS-U-PEP-2002, *Facility Protection for Severe Conditions*

UDS-U-PRP-0002, *Purchase Requisition*



UDS-U-PRP-0027, *High-Risk Property*

UDS-U-QAP-0003, *Procedure System*

UDS-U-QAP-0005, *Condition Reporting*

UDS-U-QAP-0012, *Independent Assessments*

UDS-U-QAP-0013, *Management Assessments*

UDS-U-QAP-0014, *Supplier Quality Program Evaluation*

UDS-U-QAP-0017, *Lessons Learned*

UDS-U-QAP-0018, *Root Cause Analysis*

UDS-U-QAP-0019, *Trending*

UDS-U-QAP-0026, *Commercial Grade Items Dedication*

UDS-U-QAP-0028, *Suspect/Counterfeit Items*

UDS-U-SHP-0210, *Personal Protective Equipment*

UDS-U-SHP-0211, *Hazard Assessment*

UDS-U-TRN-0001, *Training and Qualification*

UDS-X-TSR-001, Technical Safety Requirements for the Department of Energy X-745C, X-745E, and X-745G-1 UF<sub>6</sub> Cylinder Storage Yards, Piketon, Ohio; Revision 2, February 2006

UDS-X-TSR-002, Technical Safety Requirements for the DUF<sub>6</sub> Conversion Facility, Piketon, Ohio

## **6. ATTACHMENT**

*DOE Order 433.1A Contractor Requirements Document Crosswalk*

## ATTACHMENT A

## DOE ORDER 433.1A CONTRACTOR REQUIREMENTS DOCUMENT CROSSWALK

| DOE Order 433.1A<br>Contractor Requirements Document   |   | UDS Implementing Documents   |  |
|--|---|--|--|
| Section 2, Requirements  |   |  |  |
| References   |   |  |  |
| • 433.1A, a.   |   |  |  |
| Contractors must develop and submit for DOE approval MIPs that clearly define the following: |   | • DOE O 433.1A   | • DUF6-UDS-PLN-056, <i>Maintenance Implementation Plan</i>   |
| (1)  | MEL of SSCs included in the program—all safety SSCs that are (1) identified in the nuclear facility safety basis, (2) critical-to-mission objectives or facility operations, or (3) desirable for inclusion in the maintenance program for other reasons. | • DOE G 433.1-1, Sections 4.4.2 and 4.4.2<br>• 10 CFR 830.204                                  | • DUF6-UDS-PLN-023, <i>Configuration Management Plan</i><br>• MPS database lists all system equipment, including M&TE within the MEL (the MEL resides within the MPS database)<br>• UDS-EDI-002, <i>Identification and Control of Configured Items</i><br>• UDS-U-GFP-0108, <i>Control of Work</i>   |
| (2)  | Periodic inspection of SSCs and equipment to determine whether degradation or technical obsolescence threatens performance or safety.   | • DOE G 433.1-1, Section 4.13, <i>Facility Condition Inspection</i> (replaces DOE-STD-1072-94) | • UDS-U-PEP-1003, <i>Assessing System Status and Performance</i>   |
| (3)  | Management systems that control maintenance of defined SSCs (work control, post-maintenance testing, material procurement and handling, and control and calibration of test equipment).   | • DOE G 433.1-1, Section 3.2, <i>Boundaries</i> , Page 40, No. 2                               | • DUF6-UDS-PLN-003, <i>Project Quality Assurance Plan (PQAP)</i><br>• DUF6-UDS-PLN-023, <i>Configuration Management Plan</i><br>• UDS-U-GFP-0108, <i>Control of Work</i><br>• UDS-U-MNT-0004, <i>Material Control</i><br>• UDS-U-MNT-0603, <i>Control of Measuring and Test Equipment</i><br>• UDS-U-PEP-1004, <i>Post-Maintenance Testing</i><br>• UDS-U-QAP-0026, <i>Commercial Grade Items Dedication</i> |
| (4)  | Assignment of roles and responsibilities and appropriate maintenance-related training and qualification requirements.   | • DOE G 433.1-1, Section 3.2, <i>Boundaries</i> , Page 40, No. 3                               | • UDS-U-CON-0001, <i>Conduct of Operations Manual</i><br>• UDS-U-GFP-0108, <i>Control of Work</i><br>• UDS-U-TRN-0001, <i>Training and Qualification</i>   |
| (5)  | Interfaces between maintenance and other organization (e.g., operations, engineering, and training).  | • DOE G 433.1-1, Section 3.2, <i>Boundaries</i> , Page 40, No. 4                               | • DUF6-UDS-PLN-014, <i>Conversion Facilities Operations and Maintenance Plan</i>   |
| (6)  | Integration with:   |  |  |

| DOE Order 433.1A<br>Contractor Requirements Document |   |  | UDS Implementing Documents   |
|--|---|--|--|
| Section 2, Requirements                              |   | References   |  |
| (6)(a)   | The ISMS established by   | <ul style="list-style-type: none"> <li>• DOE P 450.4</li> <li>• 48 CFR 970.5204-2</li> </ul>   | <ul style="list-style-type: none"> <li>• DUF6-UDS-PLN-040, <i>Integrated Safety Management Plan - Operations</i></li> <li>• UDS-U-GFP-0108, <i>Control of Work</i></li> <li>• UDS-U-SHP-0211, <i>Hazard Assessment</i></li> </ul>  |
| (6)(b)   | Real property asset management programs and the ISMS principles and functions | <ul style="list-style-type: none"> <li>• DOE O 430.1</li> <li>• 10 CFR 830.121(C)(2)</li> <li>• 10 CFR 830.122(a)</li> <li>• DOE G 450.4-1B, ISMS Principles 1 &amp; 2 and Function 1</li> </ul> | <ul style="list-style-type: none"> <li>• DUF6-UDS-PLN-030, <i>Asset Management Plan</i></li> <li>• DUF6-UDS-PLN-040, <i>Integrated Safety Management Plan – Operations</i></li> </ul> <p><u>Comment:</u> DUF6-UDS-PLN-030, <i>Asset Management Plan</i>, and its implementing procedures have been approved by the assigned DOE property representative located at the DOE CBC.</p>  |
| (6)(c)   | Required nuclear safety bases established under                               | <ul style="list-style-type: none"> <li>• 10 CFR 830, Subpart B</li> </ul>  | <ul style="list-style-type: none"> <li>• DUF6-C-G-DSA-002, <i>Documented Safety Analysis for the Department of Energy C-745 UF<sub>6</sub> Cylinder Storage Yards, Paducah, Kentucky</i></li> <li>• DUF6-UDS-C-G-DSA-001, <i>Paducah Conversion Facility Documented Safety Analysis</i></li> <li>• DUF6-UDS-PLN-037, <i>Safety Management Program Descriptions for the Uranium Disposition Services, LLC DUF<sub>6</sub> Conversion Project</i></li> <li>• DUF6-UDS-X-G-DSA-001, <i>Portsmouth Conversion Facility Documented Safety Analysis</i></li> <li>• DUF6-X-G-DSA-002, <i>Documented Safety Analysis for the Department of Energy X-745C, X-745E and X-745G-1 UF<sub>6</sub> Cylinder Storage Yards, Piketon, Ohio</i></li> <li>• UDS-C-TSR-001, <i>Technical Safety Requirements for the Department of Energy C-745 UF<sub>6</sub> Cylinder Storage Yards, Paducah, Kentucky</i></li> <li>• UDS-C-TSR-002, <i>Technical Safety Requirements for the Paducah DUF<sub>6</sub> Conversion Facility</i></li> <li>• UDS-QAP-004, <i>Graded Approach</i></li> <li>• UDS-X-TSR-001, <i>Technical Safety Requirements for the Department of Energy X-745C, X-745E, and X-745G-1 UF<sub>6</sub> Cylinder Storage Yards, Piketon, Ohio</i></li> <li>• UDS-X-TSR-002, <i>Technical Safety Requirements for the Portsmouth DUF<sub>6</sub> Conversion Facility</i></li> </ul> |

| DOE Order 433.1A<br>Contractor Requirements Document |  |   | UDS Implementing Documents  |
|--|--|---|---|
| Section 2, Requirements                              |  | References  |   |
| (6)(d)   | Quality assurance program established in:  | 10 CFR 830, Subpart A   | <ul style="list-style-type: none"> <li>• DUF6-UDS-PLN-003, <i>Project Quality Assurance Plan</i></li> <li>• UDS-U-GFP-0108, <i>Control of Work</i></li> <li>• UDS-U-MNT-0601, <i>Measurement and Calibration Program</i></li> <li>• UDS-U-MNT-0603, <i>Control of Measuring and Test Equipment</i></li> <li>• UDS-U-QAP-0005, <i>Condition Reporting</i></li> </ul> |
| (7)  | Configuration management processes to ensure the integrity of the identified nuclear facility safety SSCs using a graded approach.   | <ul style="list-style-type: none"> <li>• DOE-STD-1073-93</li> <li>• 10 CFR 830.122(d) and (e)</li> </ul>                      | <ul style="list-style-type: none"> <li>• DUF6-UDS-PLN-023, <i>Configuration Management Plan</i></li> <li>• UDS-EDP-001, <i>Engineering Review and Approval of Design Documents</i></li> <li>• UDS-QAP-004, <i>Graded Approach</i></li> </ul>  |
| (8)  | Prioritization processes that place proper emphasis on safety requirements, maintenance backlog, system availability, and requirements for those infrastructure elements identified as part of the nuclear facility safety bases.  |   | <ul style="list-style-type: none"> <li>• UDS-U-GFP-0108, <i>Control of Work</i></li> <li>• UDS-U-PEP-1003, <i>Assessing System Status and Performance</i></li> </ul>  |
| (9)  | Processes for feedback and improvement based on relevant information from the results of operations, maintenance and assessment efforts.   | <ul style="list-style-type: none"> <li>• 10 CFR 830.122(c), (i) and (j)</li> <li>• DOE G 450.4-1B, ISMS Function 5</li> </ul> | <ul style="list-style-type: none"> <li>• UDS-U-QAP-017, <i>Lessons Learned</i></li> <li>• UDS-U-GFP-0108, <i>Control of Work</i></li> <li>• UDS-U-PEP-1009, <i>Systems Engineering</i></li> <li>• UDS-U-QAP-0013, <i>Management Assessments</i></li> </ul>  |
| (10)   | Descriptions of how system engineers assigned to safety systems are involved in the planning and execution of maintenance activities affecting their assigned systems with—<br>(a) requisite knowledge of system safety design basis and operating limits from the safety analysis and<br>(b) lead responsibility for the configuration management of the design       |   | <ul style="list-style-type: none"> <li>• DUF6-UDS-PLN-023, <i>Configuration Management Plan</i></li> <li>• UDS-U-PEP-1009, <i>Systems Engineering</i></li> </ul>  |
| (11)   | Accurate maintenance histories that compile retrievable structures, systems, and components data and other maintenance, resource, and cost data in a form that allows entering required maintenance costs, actual maintenance costs, and availability data and failure rates for mission-critical and safety SSCs into the DOE Facility Information Management System. | <ul style="list-style-type: none"> <li>• DOE O 430.1B</li> <li>• DOE G 433.1-1 (Section 4.15)</li> </ul>                      | <ul style="list-style-type: none"> <li>• DUF6-UDS-PLN-014, <i>Conversion Facilities Operations and Maintenance Plan</i></li> <li>• DUF6-UDS-PLN-030, <i>Asset Management Plan</i></li> <li>• Files resident in the MPS database</li> <li>• UDS-U-PEP-1009, <i>Systems Engineering</i></li> </ul>  |

| DOE Order 433.1A<br>Contractor Requirements Document |   |   | UDS Implementing Documents  |
|--|---|---|---|
| Section 2, Requirements                              |   | References  |   |
| • 433.1A, b.   |   |   |   |
| Contractor maintenance management programs should—   |   |   | • UDS-U-PEP-1009, <i>Systems Engineering</i><br><u>Comment:</u> Relates to CRD 2.0 in body of procedure.  |
| (1)  | Establish metrics to measure performance and identify maintenance issues requiring corrective action and lessons learned  |   | • UDS-U-QAP-0005, <i>Condition Reporting</i><br>• UDS-U-QAP-0018, <i>Root Cause Analysis</i><br>• UDS-U-QAP-0019, <i>Trending</i><br><u>Comment:</u> Relates to CRD 2.0 in body of procedure. |
| (2)  | Incorporate appropriate voluntary consensus standards, and  |   | • UDS-U-PEP-1009, <i>Systems Engineering</i><br><u>Comment:</u> Relates to CRD 2.0 in body of procedure.  |
| (3)  | Address the following elements as appropriate:  |   |   |
| (3)(a)   | <u>Maintenance Organization and Administration</u> that must ensure a high level of performance through effective implementation and control of activities.   | • DOE G 433.1-1, Section 4.1<br>• 10 CFR 830.122(a)<br>• 10 CFR 830.121( c)(4)<br>• DOE G 450.4-1B, ISMS Principles 1, 2, & 7   | • UDS-U-GFP-0108, <i>Control of Work</i><br>• UDS-U-QAP-0013, <i>Management Assessments</i>   |
| (3)(b)   | <u>Training and Qualification for Maintenance Personnel</u> that must be implemented to develop and maintain the knowledge and skills needed by personnel to perform maintenance activities effectively.  | • DOE 5480.20A<br>• DOE O 414.1C<br>• DOE G 433.1-1, Section 4.2<br>• DOE HDBK-1206-98<br>• DOE-HDBK-1003-96<br>• 10 CFR 830.122(b)<br>• DOE G 450.4-1B, ISMS Principle 3 | • UDS-U-TRN-0001, <i>Training and Qualification</i>   |
| (3)(c)   | <u>Maintenance Facilities, Equipment, and Tools</u> that support nuclear facility maintenance and maintenance training efficiently.   | • DOE G 433.1-1, Section 4.3  | • DUF6-UDS-PLN-014, <i>Conversion Facilities Operations and Maintenance Plan</i>  |
| (3)(d)   | <u>Types of Maintenance</u> that balance corrective and preventive maintenance properly, to provide a high degree of confidence that nuclear facility equipment degradation is identified and corrected, equipment life is optimized, and that the maintenance program is cost effective. | • 48 CFR 45.509<br>• DOE G 433.1-1, Section 4.4<br>• 10 CFR 830.122(c) and (e)<br>• DOE G 450.4-1B, ISMS Principle 4 and Function 1                                       | • UDS-U-PEP-1009, <i>Systems Engineering</i>  |

| DOE Order 433.1A<br>Contractor Requirements Document |   |   | UDS Implementing Documents  |
|--|---|---|---|
| Section 2, Requirements                              |   | References  |   |
| (3)(e)   | Maintenance Procedures and other work related documents (e.g., drawings and instructions) prepared and used to provide appropriate work direction and to ensure that maintenance is performed safely and efficiently.       | <ul style="list-style-type: none"> <li>• DOE G 433.1-1, Section 4.5</li> <li>• DOE-STD-1029-92</li> <li>• 10 CFR 830.122(d) and (e)</li> <li>• DOE G 450.4-1B, ISMS Principles 5 &amp; 6 and Functions 4 &amp; 5</li> </ul>                   | <ul style="list-style-type: none"> <li>• UDS-U-DMP-0001, <i>Document Control</i></li> <li>• UDS-U-GFP-0108, <i>Control of Work</i></li> <li>• UDS-U-QAP-0003, <i>Procedure System</i></li> </ul>  |
| (3)(f)   | Planning, Scheduling & Coordination of Maintenance implemented to—  | <ul style="list-style-type: none"> <li>• DOE G 433.1-1, Section 4.6 and 4.7</li> <li>• 10 CFR 830.122(a)</li> <li>• DOE G 450.4-1B, ISMS Principles 1 &amp; 4 and Function 1</li> </ul>   | <ul style="list-style-type: none"> <li>• DUF6-UDS-PLN-005, <i>Waste Management Plan</i></li> <li>• DUF6-UDS-PLN-007, <i>Radiation Protection Plan</i></li> <li>• Files resident in the MPS database</li> <li>• UDS-RPP-017, <i>ALARA/Design and Control</i></li> <li>• UDS-U-GFP-0108, <i>Control of Work</i></li> <li>• UDS-U-PEP-1003, <i>Assessing System Status and Performance</i></li> <li>• UDS-U-PEP-1009, <i>Systems Engineering</i></li> <li>• UDS-U-SHP-0210, <i>Personal Protective Equipment</i></li> <li>• UDS-U-SHP-0211, <i>Hazard Assessment</i></li> <li>• UDS-U-TRN-0001, <i>Training and Qualification</i></li> </ul> |
| (3)(f)1  | ensure maintenance, including surveillance associated with TSRs is accomplished in a timely manner  |   |   |
| (3)(f)2  | improve efficiency  |   |   |
| (3)(f)3  | reduce chemical and physical hazard radiation exposure to ALARA levels  |   |   |
| (3)(f)4  | increase equip. availability  |   |   |
| (3)(f)5  | ensure worker safety through training & proper use of personal protective equipment   |   |   |
| (3)(f)6  | ensure that hazardous waste is properly segregated, treated, or disposed of   |   |   |
| (3)(f)7  | ensure that hazards are appropriately identified, assessed, and controlled prior to commencement of maintenance work  |   |   |
| (3)(g)   | Control of Maintenance Activities that includes management involvement to ensure that safe, reliable nuclear facility operations are integrated with work authorization and control requirements for conduct of operations. | <ul style="list-style-type: none"> <li>• 10 CFR 830.122(a) and (e)</li> <li>• DOE 5480.19</li> <li>• DOE G 433.1-1, Section 4.7</li> <li>• DOE G 450.4-1B, ISMS Principles 1, 2, &amp; 7 and Function 4</li> <li>• DOE-STD-1039-93</li> </ul> | <ul style="list-style-type: none"> <li>• DUF6-UDS-PLN-023, <i>Configuration Management Plan</i></li> <li>• UDS-U-GFP-0108, <i>Control of Work</i></li> <li>• UDS-U-PEP-1009, <i>Systems Engineering</i></li> </ul>  |
| (3)(h)   | Post Maintenance Testing performed to verify that components fulfill their design functions when returned to service after maintenance.   | <ul style="list-style-type: none"> <li>• 10 CFR 830.122 (h)</li> <li>• DOE G 433.1-1, Section 4.8</li> <li>• DOE-STD-1039-93</li> </ul>   | <ul style="list-style-type: none"> <li>• UDS-U-PEP-1004, <i>Post-Maintenance Testing</i></li> </ul>   |

| DOE Order 433.1A<br>Contractor Requirements Document |   |   | UDS Implementing Documents  |
|--|---|---|---|
| Section 2, Requirements                              |   | References  |   |
| (3)(i)   | <u>Procurement of Parts, Materials, and Services</u> required for maintenance activities, to ensure availability when needed.   | <ul style="list-style-type: none"> <li>• 10 CFR 830.122(g)</li> <li>• DOE G 440.1-6</li> <li>• DOE G 433.1-1, Section 4.9</li> </ul>  | <ul style="list-style-type: none"> <li>• Files resident in the MPS database</li> <li>• UDS-U-PRP-0002, <i>Purchase Requisition</i></li> </ul>   |
| (3)(j)   | <u>Receipt, Inspection, Handling, Storage, Retrieval, Issuance, and Disposal Turn-In of Personal Property</u> used for maintenance <i>should be</i> covered by effective implementation of policies and procedures; suspect and counterfeit item control requirements; and high-risk personal property management and control requirements from the time an item is received for installation in or maintenance of the nuclear facility until it is turned in for disposal. | <ul style="list-style-type: none"> <li>• 10 CFR 830.122(g)</li> <li>• DOE G 433.1-1, Section 4.10</li> <li>• DOE G 440.1-6</li> <li>• DOE O 414.1C</li> <li>• DOE O 440.1A</li> <li>• DOE Personal Property Letter 970-3</li> </ul> | <ul style="list-style-type: none"> <li>• DUF6-UDS-PLN-003, <i>Project Quality Assurance Plan (PQAP)</i></li> <li>• DUF6-UDS-PLN-030, <i>Asset Management Plan</i></li> <li>• UDS-QAP-004, <i>Graded Approach</i></li> <li>• UDS-U-MNT-0004, <i>Material Control</i></li> <li>• UDS-U-PRP-0027, <i>High-Risk Property</i></li> <li>• UDS-U-QAP-0026, <i>Commercial Grade Items Procurement</i></li> <li>• UDS-U-QAP-0028, <i>Suspect/Counterfeit Items</i></li> </ul>  |
| (3)(k)   | <u>Control and Calibration of M&amp;TE</u> consistent with quality assurance requirements to ensure the acceptable accuracy and precision of nuclear instrumentation and equipment.   | <ul style="list-style-type: none"> <li>• 10 CFR 830.122(e) and (h)</li> <li>• DOE G 433.1-1, Section 4.11</li> <li>• DOE O 414.1C</li> </ul>  | <ul style="list-style-type: none"> <li>• UDS-U-MNT-0601, <i>Measurement and Calibration Program</i></li> <li>• UDS-U-MNT-0603, <i>Control of Measuring and Test Equipment</i></li> </ul>  |
| (3)(l)   | <u>Maintenance Tools and Equipment Control</u> methods established to provide for storage, issuance, and maintenance of an adequate and readily available supply of tools and equipment and for the development of special tools and equipment needed.  | <ul style="list-style-type: none"> <li>• 10 CFR 830.122(e)</li> <li>• DOE G 433.1-1, Section 4.12</li> </ul>  | <ul style="list-style-type: none"> <li>• UDS-U-PEP-1009, <i>Systems Engineering</i></li> </ul>  |
| (3)(m)   | <u>Facility Condition Inspection</u> conducted by management, who periodically direct independent assessments of equipment and facilities, (1) to ensure safe nuclear facility conditions and housekeeping and (2) to meet the fire protection and natural hazard phenomena mitigation requirements of DOE O 420.1A, <i>Facility Safety</i> .   | <ul style="list-style-type: none"> <li>• 10 CFR 830.122 (h) and (j)</li> <li>• DOE G 433.1-1, Section 4.13</li> <li>• DOE O 420.1B</li> </ul>   | <ul style="list-style-type: none"> <li>• DUF6-UDS-PLN-030, <i>Asset Management Plan</i></li> <li>• UDS-SHP-803, <i>Evacuation Alarms and Good Housekeeping Practices</i></li> <li>• UDS-SHP-810, <i>Program for Controlling Combustion and Ignition Sources</i></li> <li>• UDS-U-PEP-1003, <i>Assessing System Status and Performance</i></li> <li>• UDS-U-PEP-1009, <i>Systems Engineering</i></li> <li>• UDS-U-QAP-0012, <i>Independent Assessments</i></li> <li>• UDS-U-QAP-0013, <i>Management Assessments</i></li> </ul> |
| (3)(n)   | <u>Management Involvement</u> of corporate and nuclear facility officials (sufficient to be technically informed and personally familiar with   | <ul style="list-style-type: none"> <li>• 10 CFR 830.122(a) and (i)</li> <li>• DOE G 433.1-1, Section 4.14</li> </ul>  | <ul style="list-style-type: none"> <li>• UDS-U-CON-0001, <i>Conduct of Operations Manual</i></li> <li>• UDS-U-GFP-0108, <i>Control of Work</i></li> </ul>   |

| DOE Order 433.1A<br>Contractor Requirements Document |  |  | UDS Implementing Documents  |
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| Section 2, Requirements                              |  | References   |   |
|  | facility status and conditions).   |  | <ul style="list-style-type: none"> <li>• UDS-U-QAP-0013, <i>Management Assessments</i></li> </ul>   |
| (3)(o)   | <u>Maintenance History</u> and trending program, to document historical information (for maintenance planning) and to support maintenance and performance trending of nuclear facility systems and components (with all records and documentation maintained according to an approved site-specific records retention and disposition schedule). | <ul style="list-style-type: none"> <li>• 10 CFR 830.122(d)</li> <li>• DOE G 433.1-1, Section 4.15</li> <li>• DOE O 200.1</li> </ul>  | <ul style="list-style-type: none"> <li>• Files resident in the MPS database</li> <li>• UDS-U-PEP-1009, <i>Systems Engineering</i></li> </ul>  |
| (3)(p)   | <u>Analysis of Maintenance Problems</u> to determine and correct root causes of unplanned occurrences related to maintenance.  | <ul style="list-style-type: none"> <li>• 10 CFR 830.122(c)</li> <li>• DOE G 433.1-1, Section 4.16</li> <li>• DOE-NE-STD-1004-92</li> </ul>   | <ul style="list-style-type: none"> <li>• UDS-U-QAP-0005, <i>Condition Reporting</i></li> <li>• UDS-U-QAP-0018, <i>Root Cause Analysis</i></li> <li>• UDS-U-QAP-0019, <i>Trending</i></li> </ul>   |
| (3)(q)   | <u>Modification Work</u> at nuclear facilities accomplished under the same basic administrative controls as those applied to nuclear facility maintenance (so that risks to the facility, equipment, environment, or personnel do not increase because of modifications). Controls should be integrated with—                                    | <ul style="list-style-type: none"> <li>• 10 CFR 830, Subparts A and B</li> <li>• DOE G 433.1-1, Section 4.17</li> <li>• DOE G 450.4-1B, ISMS Principle 7 and Function 4</li> <li>• DOE-STD-1039-93</li> <li>• DOE-STD-1073-2003</li> </ul> | <ul style="list-style-type: none"> <li>• DUF6-UDS-PLN-003, <i>Project Quality Assurance Plan (PQAP)</i></li> <li>• DUF6-UDS-PLN-023, <i>Configuration Management Plan</i></li> <li>• UDS-EDP-012, <i>Design Change Control</i></li> <li>• UDS-U-QAP-0028, <i>Suspect/Counterfeit Items</i></li> <li>• UDS-U-GFP-0108, <i>Control of Work</i></li> <li>• UDS-U-NSP-0002, <i>Unreviewed Safety Questions</i></li> <li>• UDS-U-PEP-1003, <i>Assessing System Status and Performance</i></li> <li>• UDS-U-QAP-0014, <i>Supplier Quality Program Evaluation</i></li> </ul> |
| (3)(q)1  | Safety basis, nuclear safety, fire protection, and natural hazard phenomena mitigation   | <ul style="list-style-type: none"> <li>• DOE O 420.1B</li> </ul>   |   |
| (3)(q)2  | Pressure safety and suspect and counterfeit item control   | <ul style="list-style-type: none"> <li>• DOE O 440.1A</li> </ul>   |   |
| (3)(q)3  | Control of equipment and system status   | <ul style="list-style-type: none"> <li>• DOE O 5480.19</li> </ul>  |   |
| (3)(r)   | <u>Seasonal Facility Preservation</u> to prevent equipment and building damage resulting from weather conditions.  | <ul style="list-style-type: none"> <li>• 10 CFR 830.120</li> <li>• 10 CFR 830.122(e)</li> <li>• DOE G 433.1-1, Section 4.18</li> </ul>   | <ul style="list-style-type: none"> <li>• UDS-U-PEP-2002, <i>Facility Protection for Severe Conditions</i></li> </ul>  |



| DOE Order 433.1A<br>Contractor Requirements Document  |            | UDS Implementing Documents   |
|---|------------|--|
| Section 2, Requirements   | References |  |
| • 433.1A, 3.  |            |  |
| <u>Deviations or Nonapplicability.</u> Any deviations from the maintenance management program elements of the Order will be identified and formally documented (with supporting justification within the MIP) and approved by the DOE approval authority. |            | <u>Comment/Requirement:</u> UDS shall operate its conversion facilities in accordance with DOE Order 433.1A.                       |
| • 433.1A, 4.  |            |  |
| <u>Exemptions.</u> Exemptions to this CRD shall be dispositioned using the exemption process prescribed in DOE M 251.1-1B, Chapter X, and shall be approved by the DOE approval authority.  |            | <u>Comment/Requirement:</u> UDS shall seek approval for exemptions from CRD requirements.  |
| • 433.1A, 5.  |            |  |
| <u>Review And Update.</u> The contractor will review and update the MIP every 2 years and will submit changes to DOE for approval.  |            | <u>Comment/Requirement:</u> UDS shall review its MIP every 2 years and shall submit any non-editorial changes to DOE for approval. |

END OF DOCUMENT